

Claims:

1. A method for isolating a biopolymer from an aqueous solution utilizing magnetic particles comprising the steps of:

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a) adding magnetic particles to an aqueous solution comprising the biopolymer of interest in the presence of a salt and an additive,

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b) incubating the aqueous solution of step a) to allow the particles of step a) and the biopolymer of step a) to form a complex,

c) applying a magnetic field to said solution to separate the magnetic particles from said solution, and

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d) washing the separated magnetic particles of step c) under conditions in which said biopolymer is eluted from said magnetic particles,

wherein no substantial clustering of said magnetic particles occurs during the performance of the method.

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2. A method according to claim 1, wherein the biopolymer is nucleic acid.

3. A method according to claim 2, wherein the nucleic acid is DNA.

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4. A method according to claim 1, wherein the magnetic particles are silica magnetic particles.

5. A method according to claim 4, wherein the silica magnetic particles are siliceous-oxide coated magnetic particles.

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6. A method according to claim 1, wherein the salt is a chaotropic salt.

7. A method according to claim 6, wherein the chaotropic salt is selected from the group of guanidine isothiocyanate, guanidine thiocyanate, guanidine

hydrochloride, sodium iodide, potassium iodide, lithium chloride, sodium perchlorate, sodium trichloroacetate or a mixture thereof.

8. A method according to claim 7, wherein the chaotropic salt is selected from the group of guanidine isothiocyanate, guanidine thiocyanate, guanidine hydrochloride or a mixture thereof.

9. A method according to claim 1, wherein the salt is a non-chaotropic salt.

10. A method according to claim 9, wherein the non-chaotropic salt is selected from the group of sodium chloride, potassium chloride, ammonium chloride, calcium chloride, magnesium chloride or a mixture thereof.

11. A method according to claims 1 and 6 to 10, wherein the concentration of the salt in the aqueous solution of step a) is in a range of from 0.1 M to 10 M.

12. A method according to claim 1, wherein the additive is selected from the group of ethylene glycol, tetraethylene glycol, polyalkylene glycol, cyclodextrin, carrageenan, dextran, dextran sulfate, xanthan, cellulose, hydroxypropyl cellulose, amylose, 2-hydroxypropyl- β -cyclodextrin, Agar Agar, glycerol, polyvinyl alcohol or a mixture thereof.

13. A method according to claim 12, wherein the polyalkylene glycol is polyethylene glycol, polypropylene glycol or a mixture thereof.

14. A method according to claim 13, wherein the polyalkylene glycol is polyethylene glycol.

15. A method according to claim 14, wherein the polyethylene glycol has a molecular weight in a range of from about 4000 g/mol to about 12000 g/mol.

16. A method according to claim 15, wherein the polyethylene glycol has a molecular weight in a range of from about 6000 g/mol to about 10000 g/mol.

17. A method according to claim 16, wherein the polyethylene glycol has a molecular weight of about 8000 g/mol.

18. A method according to claims 1 and 12 to 17, wherein the concentration of the
5 • additive in the aqueous solution of step a) is in a range of from 2% (w/v) to 7% (w/v).
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19. A method according to claim 18, wherein the concentration of the additive in the aqueous solution of step a) is in a range of from 3% (w/v) to 6% (w/v).

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20. A method according to claim 19, wherein the concentration of the additive in the aqueous solution of step a) is in a range of from 3% (w/v) to 5% (w/v).

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21. A method according to claim 20, wherein the concentration of the additive in the aqueous solution of step a) is in a range of from 3% (w/v) to 4,8% (w/v).

22. A method according to claim 1, wherein the incubation in step b) is performed at room temperature for at least 30 seconds.

20 23. A method according to claim 1, further comprising the step of washing said magnetic particles at least once following step c) and prior to step d), under conditions in which the biopolymer remains in the complex formed with said magnetic particles in step b).

25 24. A method according to any of the forgoing claims, wherein the method for isolating a biopolymer from a solution utilizing magnetic particles is an automated process.

30 25. Use of a method according to any of the forgoing claims for isolating a biopolymer of interest from an aqueous solution.

26. Use of additives according to claims 12 to 21 to substantially prevent clustering of magnetic particles in an aqueous solution.

27. Use according to claim 26, wherein the aqueous solution comprises a biopolymer of interest which forms a complex with said magnetic particles and a salt.

28. Use according to claim 27, wherein the biopolymer is a nucleic acid and the salt is
5 • a salt according to any one of the claims 6 to 11.

29. A kit for performing a method according to claims 1 to 24, the kit comprising at least:

10 a) an aliquot of magnetic particles suspended in an aqueous solution in a first container.

30. The kit of claim 29, further comprising:

15 a) an additive according to claims 12 to 21, a stock solution of said additive or a ready-to-use solution of said additive in a container, and/or

b) a salt according to claim 6 to 11, a stock solution of said salt or a ready-to-use solution of said salt in a container.

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31. The kit of claim 29 or 30, wherein the magnetic particles are silica magnetic particles.

32. The kit of claim 31, wherein the silica magnetic particles are siliceous-oxide
25 coated magnetic particles.